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ZAGORIN O'BRIEN GRAHAM LLP

Intellectual Property Attorneys

7600B N. CAPITAL OF TEXAS HWY, SUITE 350
AUSTIN, TEXAS 78731

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Date: March 16, 2005	Pages: 13 (including this sheet)
From: Steven R. Gilliam	Senders Phone No.: (512) 338-6300
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REGARDING:

Title: INDEX-BASED SCOREBOARDING SYSTEM AND METHOD	
Application No.: 09/813,498	Filed: March 21, 2001
Examiner: Daniel H. Pan	Group Art Unit: 2183
Atty. Docket No.: 004-5094	Confirmation No.: 2092

ATTACHED HERETO:

- (1) Response After Final Rejection (8 pages);
- (2) Request for Extension of Time (2 pages);
- (3) Transmittal Letter (2 pages).

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that, on the date shown below, this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office.

Steven R. Gilliam 16-MAR-2005
Steven R. Gilliam Date

Respectfully submitted,

Steven R. Gilliam
Steven R. Gilliam, Reg. No. 51,734
Attorney for Applicant(s)
(512) 338-6320
(512) 338-6301 (fax)

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 Attorney for Applicant(s)
 (512) 338-6320
 (512) 338-6301 (fax)

ZAGORIN O'BRIEN GRAHAM LLP

Intellectual Property Attorneys

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Application No.:	09/813,498	Filed:	March 21, 2001
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Attorney for Applicant(s)
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ZAGORIN O'BRIEN GRAHAM LLP

7600B N. CAPITAL OF TEXAS HWY, SUITE 350
AUSTIN, TEXAS 78731-1191

INTELLECTUAL PROPERTY ATTORNEYS

512-338-6300 (TEL)
512-338-6301 (FAX)

INTERNET: www.ip-counsel.com

March 16, 2005

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attorney Docket No.: 004-5094

Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

- ☒ Response After Final Rejection (8 page(s))
- ☒ Petition for Extension of Time (1 month) (2 page(s))
- ☐ Information Disclosure Statement (page(s)), including PTO/SB0/8A and/or
PTO/SB/08B (page(s)), and copies of reference(s)
- ☐ Other: (page(s))
- ☐ Other: (page(s))
- ☐ Other: (page(s))
- ☒ Transmittal Letter (2 pages);
- ☒ Return postcard;

The Total Fee has been calculated as shown below:

	Pending Claims	Claims Previously Paid	Extra Claims	Fees
Total Claims	14	- 31 =	0 x \$50.00 =	0.00
Independent Claims	3	- 5 =	0 x \$200.00 =	0.00
Multiple Dependent Claims (if any) - \$360.00 fee				
Additional Claims Fee				\$.00
Fee For Extension Of Time				\$120.00
Other Fees: ()				
TOTAL FEE DUE:				\$ 120.00

- ☐ Small entity status is entitled to be asserted for the application.
- ☐ The Total Filing Fee shown above is not being paid at this time.
- ☐ A check is enclosed for the Total Filing Fee shown above.
- ☒ Please charge the Total Filing Fee shown above to Deposit Account 50-0631.
- ☒ The Commissioner is hereby authorized to charge any deficiency in fees and any fees under 37 C.F.R. § 1.16 or 1.17, not submitted herewith, that may be required during the pendency of this application, and to similarly credit any overpayment, to Deposit Account 50-0631.

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Steven R. Gilliam

16-Mar-2005

Date

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Respectfully submitted,



Steven R. Gilliam, Reg. No. 51,734

Attorney for Applicant(s)

(512) 338-6320

(512) 338-6301 (fax)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Sharada Yeluri

Title: INDEX-BASED SCOREBOARDING SYSTEM AND METHOD

Application No.: 09/813,498

Filed: March 21, 2001

Examiner: Daniel H. Pan

Group Art Unit: 2183

Atty. Docket No.: 004-5094

Confirmation No.: 2092

March 16, 2005

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RESPONSE AFTER FINAL REJECTION (37 C.F.R. § 1.116)

This paper is being submitted following the Final Rejection mailed on November 19, 2004. A Request for one month Extension of Time accompanies this Response, thereby extending the period for reply until March 19, 2005. In light of the Amendments and/or Remarks herein, further consideration is requested.

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated in the following listing of all claims:

1. (Currently Amended) A method for implementing a scoreboard, comprising:
associating an instruction with an index ~~value~~ into the scoreboard, the index identifying the instruction;
associating the instruction with a scoreboard entry corresponding to the index ~~value~~;
receiving an indication that a terminating event associated with the instruction has
occurred, the indication including a corresponding index into the scoreboard; and
identifying and invalidating, based on the received index, the scoreboard entry
corresponding thereto~~associated with the instruction associated with the~~
~~terminating event.~~
2. (Original) The method of claim 1, wherein invalidating the scoreboard entry further comprises invalidating the scoreboard entry after the indication of a terminating event is received.
3. (Original) The method of claim 1, wherein:
the instruction is a load instruction; and
associating the instruction with a scoreboard entry corresponding to the index value
further comprises associating the load instruction with a scoreboard entry
corresponding to the index value.
4. (Original) The method of claim 3, wherein:
receiving an indication that a terminating event associated with the instruction has
occurred further comprises receiving an indication that load data associated with
the load instruction has been received.
5. (Cancelled)
6. (Original) The method of claim 1 further comprises:

forwarding the instruction and the index value to a load/store processing unit.

7. (Original) The method of claim 1 further comprises:
receiving the index value from a load/store processing unit.

8. (Original) The method of claim 1, wherein the scoreboard entry is one of a plurality of scoreboard entries.

9. - 20. (Cancelled)

21. (Currently Amended) A method comprising:
locating an entry in a scoreboard for an instruction with a scoreboard index returned from
a[[n]] ~~load-store~~~~execution-stage~~ unit; and
invalidating ~~modifying~~ the located scoreboard entry, based on the returned index.

22. (Previously Presented) The method of claim 21 further comprising:
installing the instruction in the scoreboard entry;
associating the scoreboard index for the scoreboard entry with the instruction; and
indicating the associated scoreboard index and the instruction to the load store unit.

23. (Previously Presented) The method of claim 21 further comprising maintaining the index and the instruction in the load store unit at least until a terminating event that corresponds to the instruction.

24. (Previously Presented) The method of claim 21, wherein the instruction includes a load instruction or a long latency instruction.

25. (Cancelled)

26. (Currently Amended) The method of claim 21, wherein a second instruction that is dependent upon the instruction[[,]] is stalled until the scoreboard index is returned from the load-store ~~execution-stage~~ unit.

27. (Cancelled)

28. (Currently Amended) An apparatus comprising:

a scoreboard unit that includes a plurality of entries configurable to be ~~and~~ indexed with scoreboard indices, the scoreboard unit configurable to indicate in each entry validity ~~and operand~~ information for an instruction ~~in each entry~~; and
an execution stage unit configurable to maintain scoreboard indices for respective instructions and to return scoreboard indices for use in locating and invalidating ~~location of~~ respective entries ~~instructions~~ in the scoreboard unit.

29. (Cancelled)

30. (Previously Presented) The apparatus of claim 29 further comprising a decode unit configurable to stall instructions dependent upon operands indicated in locked entries of the scoreboard unit.

31. (Cancelled)

REMARKS

This paper is responsive to the final Office Action dated November 19, 2004. Claims 1-31 were examined. Applicant has cancelled claims 5, 9 – 20, 25, 27, 29, and 31. Applicant has amended claims 1, 21, 26, and 28.

Rejections under 35 U.S.C. §102

Claims 1-3, 5, 8-12, 14, 17, 19, 20, 21, 23, 24, and 26-31 are rejected under 35 U.S.C. §102(a) and (b) as being anticipated by U.S. Patent No. 5,881,264 issued to Kurosawa (hereinafter "Kurosawa"). Claims 5, 9 – 12, 14, 17, 19, 20, 27, 29, and 31 have been cancelled. The remaining rejected claims include 1 – 3, 8, 21, 23, 24, 26 – 28, and 30. Claims 1, 21, 26, and 28 have been amended. Applicant respectfully submits that the addresses in Kurosawa are not scoreboard indices and that the indices of Kurosawa are not utilized as recited in Applicant's claims.

The Office contends that such subject matter is disclosed in Kurosawa at column 6, lines 33 – 52 and Figure 3. Figure 3 depicts a plurality of scoreboard tables. According to the text at column 6, lines 23 – 36, Figure 3 depicts the following:

The entry number 102 is used to distinguish entries in the scoreboard. The operation code 103 is an entry for holding the type of an operation that the processor 1 requests (e.g., "Read: means a read operation and "Write" means a write operation). The address 103 is an entry for holding a memory address to be accessed. The completion flag 104 indicates the issuing of the operation has been completed. In the valid flag 107, a flag V (Valid) is set when the corresponding entry is valid and a flag I (Invalid) is set when the corresponding entry is invalid. In other words, the entry corresponding to flag V will be issued in the future and the entry corresponding to flag I is an empty entry that is not issued.

The remaining portion of the section relied upon by the Office discloses generation of addresses, and setting of synchronization flags. Although Kurosawa discloses scoreboard indices as seen in the above quoted section, these indices are not utilized to identify and invalidate entries in the scoreboard. Kurosawa does not disclose or suggest using the scoreboard indices to identify and invalidate. Kurosawa does not explicitly disclose how entries are selected and invalidated. Kurosawa only discloses that "[a]fter processing of the memory access instruction has been

completed, the memory controller 10 sets to "T" the valid flag stored in the entry for the executed memory access instruction in the scoreboard..." (col. 9, lines 1 – 5). In fact, the disclosure of Kurosawa suggests that Kurosawa steps through the table (col. 9, line 10 – col. 11, line 50).

The Office also supports rejection of the claims by interpreting Kurosawa's addresses as scoreboard indices. Interpreting the addresses of Kurosawa as scoreboard indices both glosses over the terms utilized by Applicant in the claims and conflicts with the disclosure of Kurosawa, which already has indices. Furthermore, Kurosawa specifically discloses using the addresses to select a scoreboard and then accessing an invalid entry of the selected scoreboard, and does not disclose or suggest using the addresses for selecting a scoreboard entry and invalidating the selected entry (col. 8, lines 40 – 43).

For at least the reasons above, Kurosawa does not anticipate any of claims 1 – 3, 8, 21, 23, 24, 26 – 28, and 30. Therefore, claims 1 – 3, 8, 21, 23, 24, 26 – 28, and 30 are allowable over the art of record.

Rejections under 35 U.S.C. §103

Claims 4, 6, 7, 13, 15, 16, 18, 22 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kurosawa in view of U.S. Patent No. 6,473,832 issued to Ramagopal et al (hereinafter "Ramagopal"). Claims 13, 15, 16, 18, and 25 have been cancelled. The remaining rejected claims include claims 4, 6, 7, and 22. Applicant respectfully submits that these claims are allowable, at least because they depend from corresponding ones of the above allowable independent claims. In addition, claim 21 has been amended to recite a load-store unit.

Applicant respectfully submits that combining or modifying Kurosawa with Ramagopal still does not disclose or suggest Applicant's claims. The indices in Kurosawa only appear in the scoreboards and in the synchronization table (Figure 3). The scoreboard indices are never communicated to a load-store unit. Simply adding a load-store unit from Ramagopal to Kurosawa does not suddenly achieve forwarding or receiving a scoreboard index to/from a load-store unit as recited in claims 6 and 7, respectively. Such a combination or modification also does not disclose or suggest "locating an entry in a scoreboard for an instruction with a scoreboard index returned from a load-store unit" as recited in claim 21. Applicant respectfully

submits that a combination or modification still must disclose or teach every limitation of the claims. The combination or modification performed by the Office does not satisfy this requirement. Adding the disclosure of Ramagopal to Kurosawa provides nothing more than a load-store unit.

Moreover, Applicant does not comprehend the supposed motivation for combining Kurosawa and Ramagopal provided by the Office. The Office states the following:

It would have been obvious to one of ordinary skill in the art to use Ramagopal in Kurosawa for including the indication of load data and forwarding (or receiving) the index value and the instruction to the load/store unit as claimed because the use of Ramagopal could provide Kurosawa the capability of the control circuit to adapt to particular access conditions of a given load or store instruction, thereby reducing the processing overhead of the control p[rocessor (sic) of Kurosawa, and it could be readily done by configuring the read/write port of load/store unit of Ramagopal into Kurosawa with modified control parameters, such as the port width and data type, so that the load/store unit of Ramagopal could be recognized by Kurosawa in order to achieve the enhanced, in doing so provided a motivation.

Applicant cannot locate the evidentiary support for this contention by the Office. "It is never appropriate to rely solely on 'common knowledge' in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based" (MPEP 2144.03, *citing In re Zurko*, 258 F.3d 1379 (Fed. Cir. 2001). "[A]n assessment of basic knowledge and common sense that is not based on any evidence in the record lacks substantial evidence support" (MPEP 2144.03, *citing Id.*).

Neither Kurosawa nor Ramagopal, standing alone or in combination, disclose or suggest any of Applicant's claims, including claims 4, 6, 7, 21, and 22. For at least these reasons, Applicant's claims are allowable.

Conclusion

In summary, claims 1 – 4, 6 – 8, 21 – 24, 26, 28, and 30 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is

respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

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Steven R. Gilliam

16-Mar-2005

Date

Respectfully submitted,



Steven R. Gilliam, Reg. No. 51,734

Attorney for Applicant(s)

(512) 338-6320

(512) 338-6301 (fax)

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Sharada Yeluri
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Examiner: Daniel H. Pan Group Art Unit: 2183
Atty. Docket No.: 004-5094 Confirmation No.: 2092

March 16, 2005

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PETITION FOR EXTENSION OF TIME

This is a petition under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above-identified application. The requested extension and appropriate Fee are:

- ☒ One month extension
- ☒ Fee (37 CFR 1.17(a)): \$120
- ☐ Applicant has previously extended the period for filing the response by n/a month(s). Therefore the remaining fee amount under the 37 CFR 1.17(a) to extend the period for a total of n/a month(s) is: n/a.
- ☐ Applicant is a Small Entity. Therefore the amount shown above is reduced by one-half, and the resulting Fee is: n/a.

Payment is by:

- ☐ Check: An enclosed check includes the Fee.
- ☒ Deposit Account: Please charge the Fee to Deposit Account Number: 50-0631.
- ☒ The Commissioner is hereby authorized to charge any deficiency in fees and any additional fees which may be required, or credit any overpayment, to Deposit Account Number: 50-0631.

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